

Stress and Menstrual Cycle Characteristics

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Background:

Menstrual cycle patterns are often used as indicators of endocrine function. There is increasing interest in the relationship between the impact of stress on fecundity within the context of environmental stressors. This analysis addressed the effect of stress on the menstrual cycle characteristics.

Objectives: To prospectively assess the relationship between salivary stress biomarkers (cortisol and alpha-amylase) and menstrual cycle characteristics in a cohort of women attempting conception.

Methods: Three hundred and seventy women contributed 1088 cycles for analysis; all provided basal saliva samples for the measurement of cortisol (mg/dL) and alpha-amylase (U/ml) on day 6 of each cycle and completed daily diaries on menstruation until either a human chorionic gonadotropin confirmed pregnancy or the women completed 6 menstrual cycles without conception. A linear regression model with a mixture distribution was used to identify the association between stress levels and variations in menstrual cycle: follicular and luteal phase lengths after adjusting for age (years) at menarche and at enrollment and body mass index.

Results: A 2-day increase in menstrual cycle length for 1 mg/dL increase in cortisol level was estimated for women [$\beta = 1.93$; 95% CI (0.21, 3.66)]. Also, a 3-day increase in luteal phase length was estimated for 1 mg/dL increase in salivary cortisol level in women [$\beta = 2.94$; (95% CI 0.63, 5.24)]; no significant association was observed for follicular phase length, nor any significant associations were observed for alpha-amylase.

Conclusion(s): Stress as measured by cortisol significantly increased cycle length, especially during the luteal phase. Understanding the nature of association between stress and menstrual variability will enable improved understanding of the causes of reproductive problems, such as infertility.